Activity 11 Worksheet. Magnesium Fluoride in U-Metal Manufacturing

Componet Class:

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Assumptions:

1.) Uranium assay is 0.2% U-235

2.) Maximum level of TRU and FP in Slag is concentrated by a factor of 1.91 based on reaction of UF4 with Magnesium metal

3.) Maximum concentrations of TRU and FP are still the same as Activity 5 in the UF4

4.) All TRU and FP goes to Magnesium Fluoride Slag

5.) Uranium Metal produced at PGDP is 9E+09g (shipments-receipts)

Maximum Constituent/Calculations:

Pu: .063ppb-	In UF4	Pu: .063ppb x 1.91 =.120ppb
Np: 62.6ppb		Np: 62.6ppb x 1.91 = 120ppb In slag sample basis
Tc: 49ppb		Tc: 49 x 1.91 = 94ppb

Pu: .12 x 100/5 = 2.4ppb	In slag (U basis, Assuming 5% U)
Np: 120 x 100/5 = 2,400ppb	
Tc: 94 x 100/5 = 1,880ppb	

Occupational Potential Exposure = Airborne Potential x Constituent Level x Exposure Duration

Calculation of Potential Inhalation Dose:

(from Appendix A, Priortization of Uranium Flow)

from Pu: 2.4/4.34 x 10% = 5.5%

from Np: 2,400/379 x 10% = 63%

total = 68.5%

0-- No Significant Occupational Exposure Potential

1-- Low Ocupational Exposure Potential

2-- 2-9-- Moderate Occupational Exposure Potential

3-- >10-- High Occupational Exposure Potential

Calculation of Occupational Potential Exposure Rating

A) Airborne Potential -- 3

B) Constituent Level -- 3

C) Exposure Duration -- 2

OPE: A x B x C = 18

Overall Rating-- 3, High